

PATENT COOPERATION TREATY

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07 JUN 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

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To:

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing
(day/month/year)

01.03.2005

Applicant's or agent's file reference
WO 21.1053

IMPORTANT NOTIFICATION

International application No.
PCT/EP 03/13305

International filing date (day/month/year)
26.11.2003

Priority date (day/month/year)
12.12.2002

Applicant
SERVICES PETROLIERS SCHLUMBERGER et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO 21.1053	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/13305	International filing date (<i>day/month/year</i>) 26.11.2003	Priority date (<i>day/month/year</i>) 12.12.2002
International Patent Classification (IPC) or both national classification and IPC E21B43/38		
Applicant SERVICES PETROLIERS SCHLUMBERGER et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 7 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 08.07.2004	Date of completion of this report 01.03.2005
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized Officer Bellingacci, F Telephone No. +49 89 2399-2784 <div style="text-align: right;"> </div>

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/13305

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-11 as originally filed

Claims, Numbers

1-8 filed with telefax on 07.02.2005

Drawings, Sheets

1/5-5/5 received on 12.10.2004 with letter of 12.10.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

10/537957

JC20 Rec'd PCT/PTO 07 JUN 2005

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/13305

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

see separate sheet

Reference is made to the following documents:

D1 = US 6 213 208 B1

D2 = US 5 873 410 A

D3 = US 6 196 313 A

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- V-1 D1, which is considered as the closest prior art, describes a method of producing oil from a well comprising:
- a vertical section extending from the surface to a depth below the oil-producing formation;
 - a sidetrack extending from the vertical section into the oil-producing formation.

The further features specified in claim 1 are new and the claim meets therefore the corresponding requirement of Art. 33(2) PCT.

The problem solved by the distinguishing features of claim 1 is to provide for means simpler than the downhole pump disclosed in D1 for delivering formation fluid to the surface.

The problem is solved by providing a set of downhole valves arranged as claimed, and then forwarding fluid to the surface by a selective pressurization of the producing string.

A similar method is known from D2, which discloses both the use of downhole valves and the pressurisation of the producing string for forwarding formation fluid to the surface. This known method however is not only applied to a well not provided with a sidetrack, but also does not foresee that the separating water is at least partially collected in the part of the vertical section of the well extending below the oil producing formation. The method according to D2 offers therefore a lower production efficiency as it maintains a higher hydrostatic pressure on the producing formation.

Also D3 discloses a method for forwarding separated formation fluid to the surface without using a downhole pump, but the method differs from the one according to

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/13305

claim 1 in that it does not comprise the step of "forcing the separated oil and water back down the well", as at the contrary a dedicated displacement fluid is used for reinjecting the separated water in the downhole formation.

The subject-matter of claim 1 goes therefore behind the mere combination of the teaching of the prior art and therefore involves an inventive step.

V-2 Claims 2 to 8 are dependant on claim 1 and therefore they also meet the requirements of Art. 33 PCT.

V-3 The following objections are also raised:

- a) The embodiments of figures 6 to 9 are not more claimed, and therefore said drawings and the corresponding description passages should have been deleted from the application;
- b) Even though independent claim 1 is cast in the two part form, features presently in the preamble of the claim should have been specified in its characterizing part (see analysis in the preceding point V-1 (Rule 6.3(b) PCT).
- c) The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- d) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 to D3 is not mentioned in the description, nor are said documents identified therein.

21.1053

CLAIMS

1 A method of producing oil from a well comprising:

- a vertical section extending from the surface to a depth below the oil-producing formation;
- a sidetrack extending from the vertical section into the oil-producing formation; and
- a first valve, located in the well, and operable to prevent flow of fluid from the vertical section into the sidetrack;
- a second valve, located in the well, and operable to prevent flow fluid from the portion of the vertical section below the oil-producing formation into the sidetrack or the portion of the vertical section of the well above the sidetrack;

said method being characterized by the step of :

- allowing oil and water to flow into the well via the sidetrack until the hydrostatic pressure of the oil and water in the well balances the formation pressure of the oil-producing formation such that further flow into the well ceases;
- allowing the oil and water in the vertical section of the well to separate under gravity so as to produce (i) a lower layer of water, at least part of which is located in the part of the vertical section below the oil-producing formation, and (ii) an upper layer of oil having its upper surface below the well surface and its lower surface above the sidetrack;
- forcing the separated oil and water back down the well and operating the first valve such that substantially no fluid is forced into the sidetrack, and water is forced into the underground formation below the oil-producing formation; and
- allowing oil and water flow to recommence from the sidetrack.

2 The method as claimed in claim 1, wherein separated oil and water are forced down the well until the oil water interface is close to the lower end of the vertical section.

21.1053

- 3 The method as claimed in claim 1 or 2, wherein the steps of flowing, separating, forcing back are repeated until oil flows from the well at the surface.
- 4 The method as claimed in claim 1, 2 or 3, wherein the step of forcing separated oil and water down the well is performed by applying pressure to the vertical section from the surface.
- 5 The method as claimed in claim 4, wherein pressure is applied by pumping oil or gas into the vertical section.
- 6 The method as claimed in any of claims 1 to 5, wherein the separated oil and water are forced back down the well such that the water is re-injected into the underground formation below the producing formation.
- 7 The method as claimed in claim 6, wherein the re-injection is performed below the fracture pressure of the underground formation.
- 8 The method as claimed in any of claims 1 to 7, wherein the oil is pumped from the well.

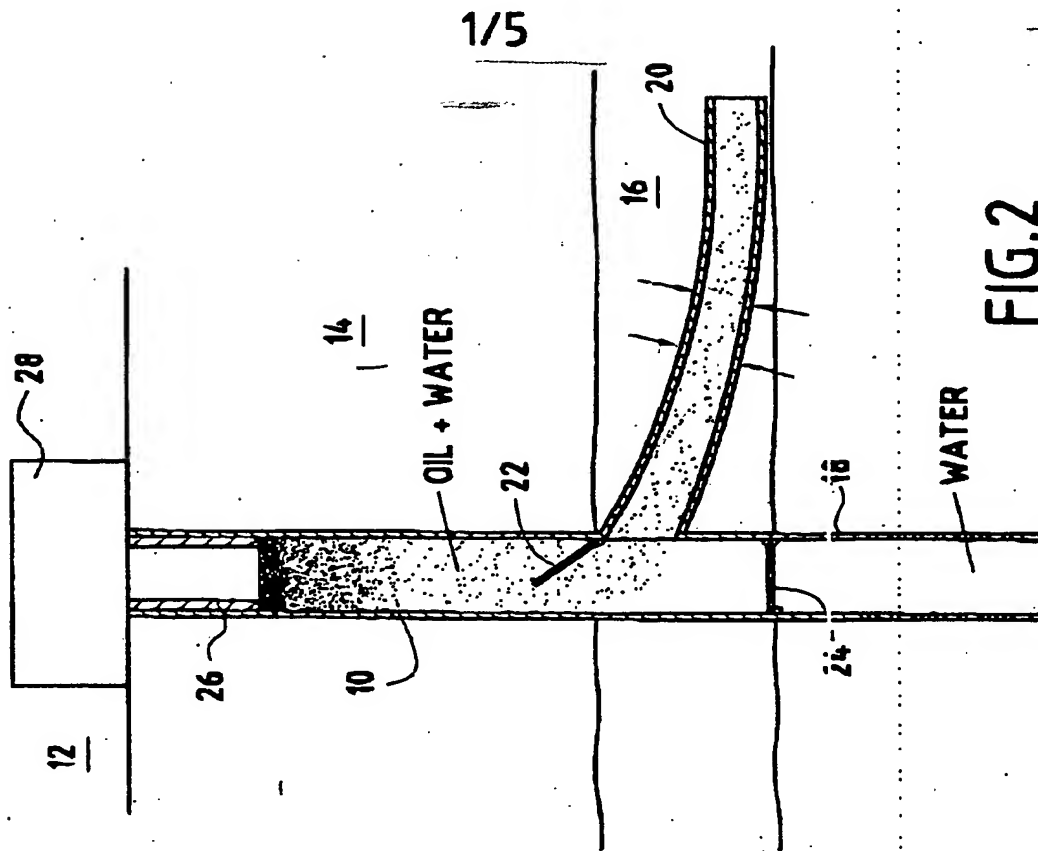


FIG. 2

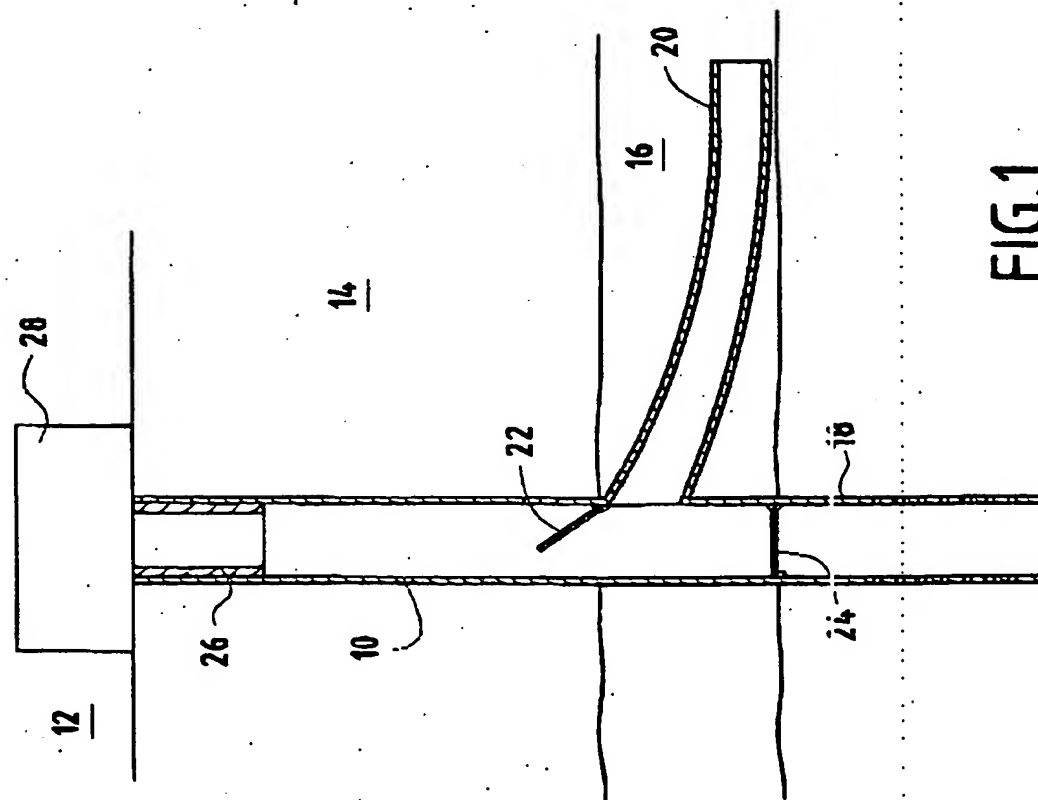
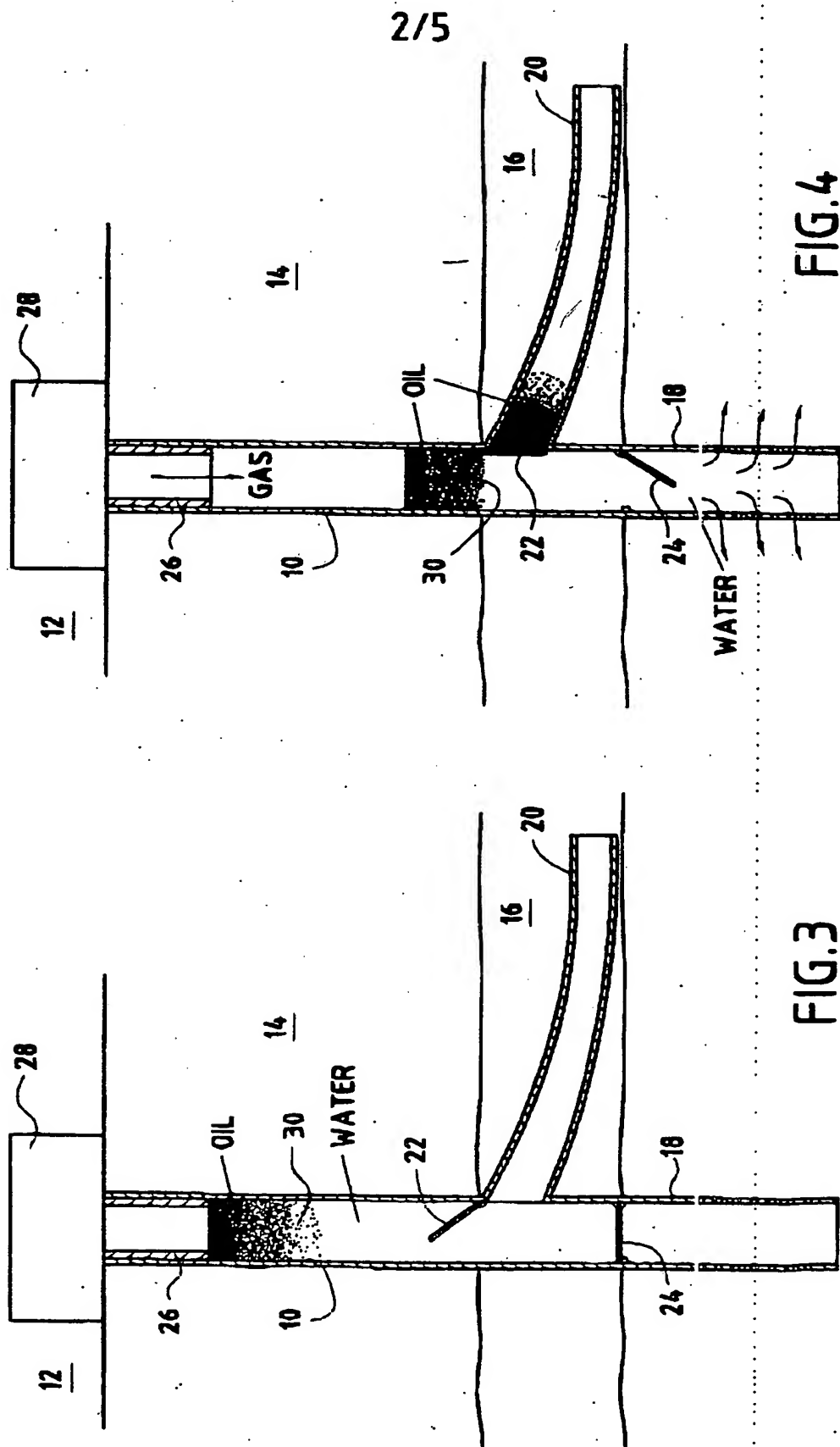
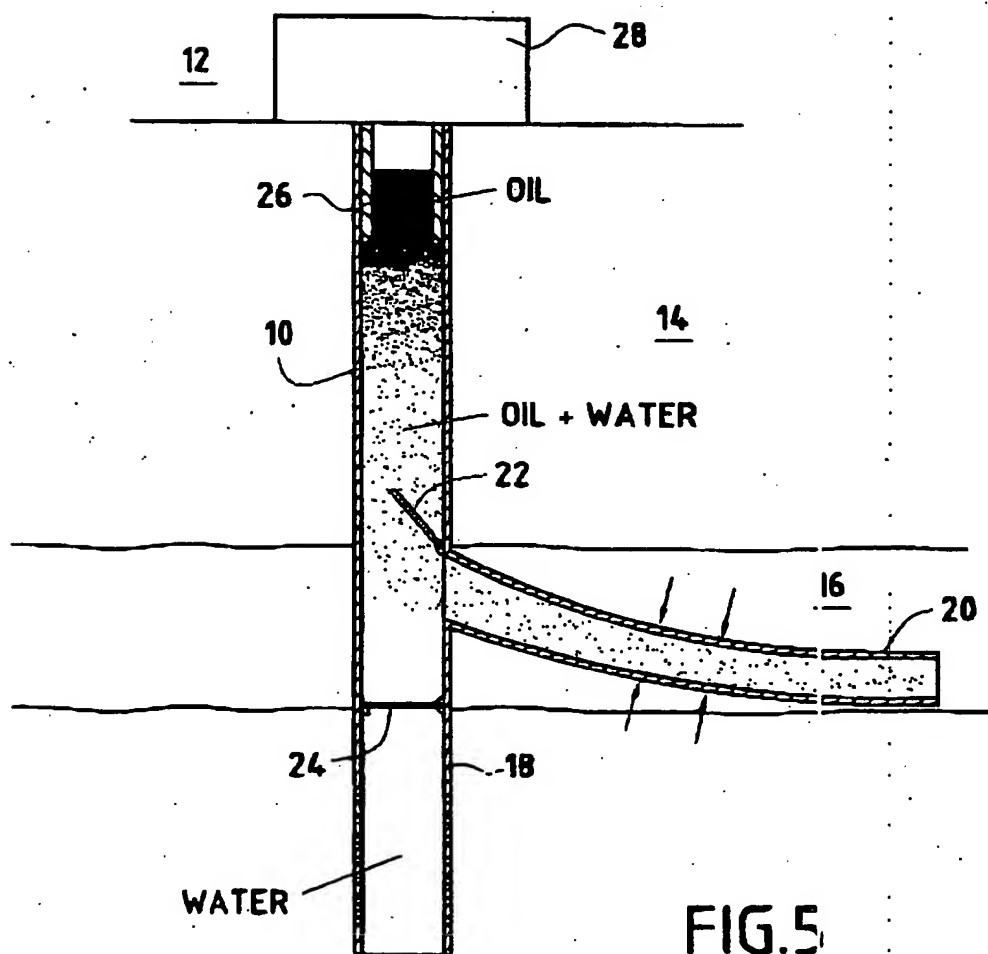


FIG. 1



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3/5



10/537957

4/5

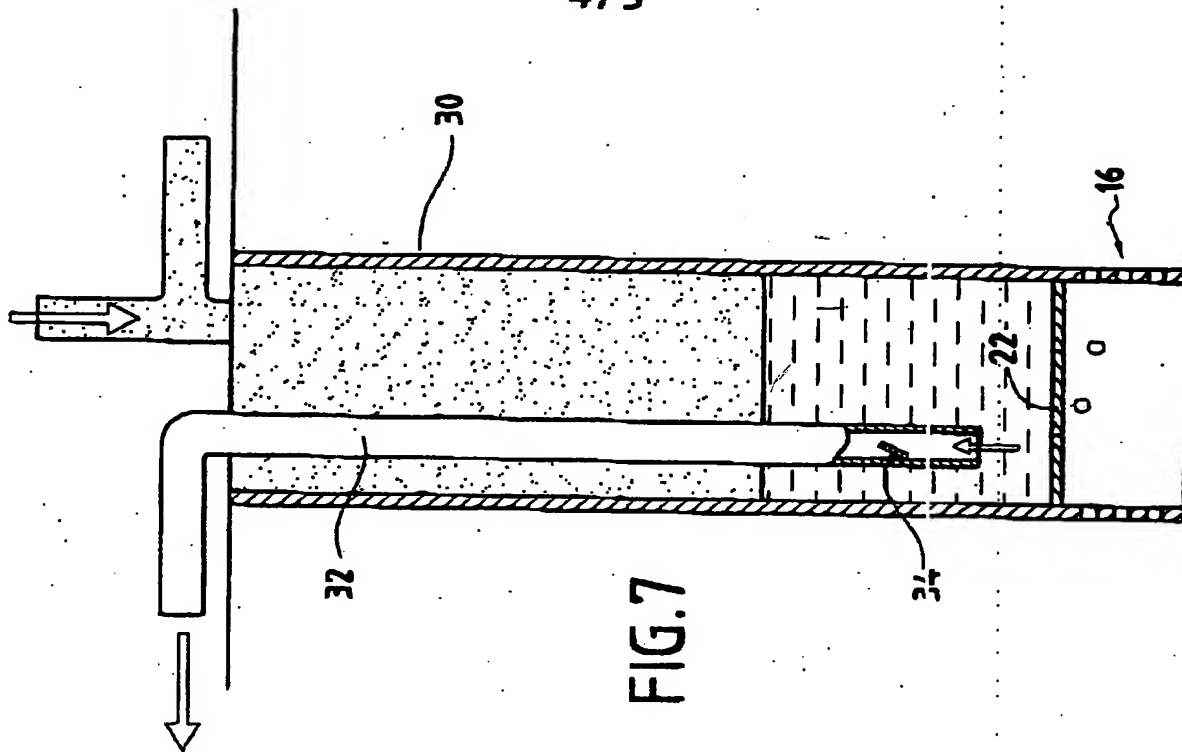


FIG. 7

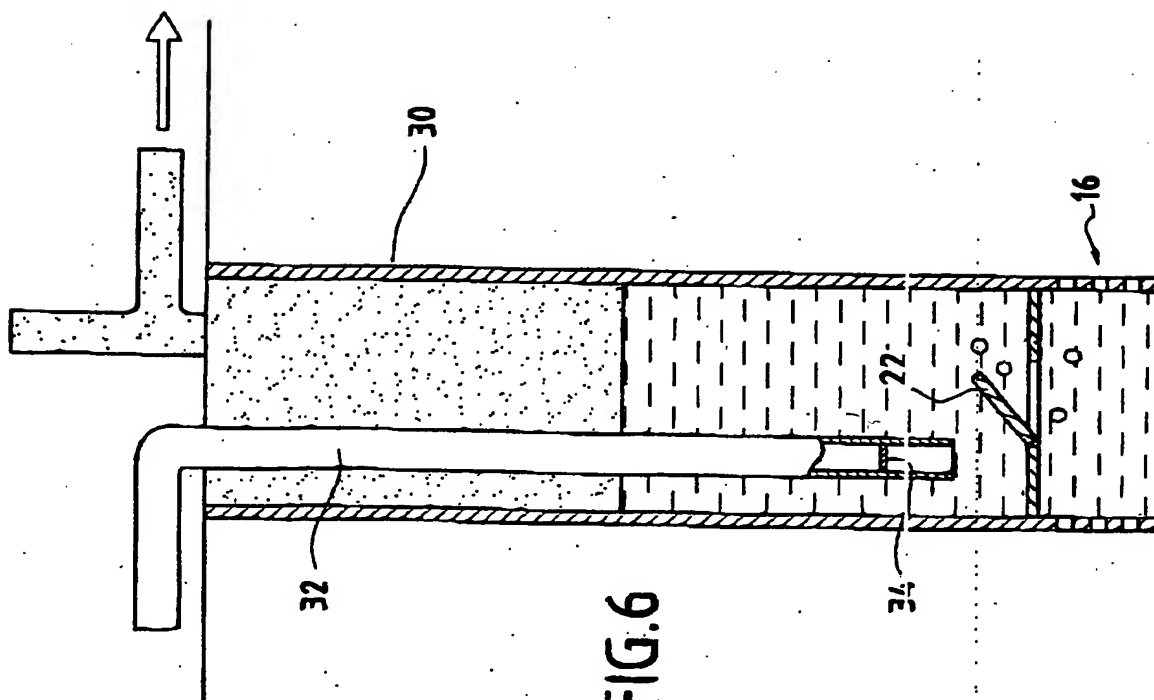


FIG. 6

10/537957

5/5

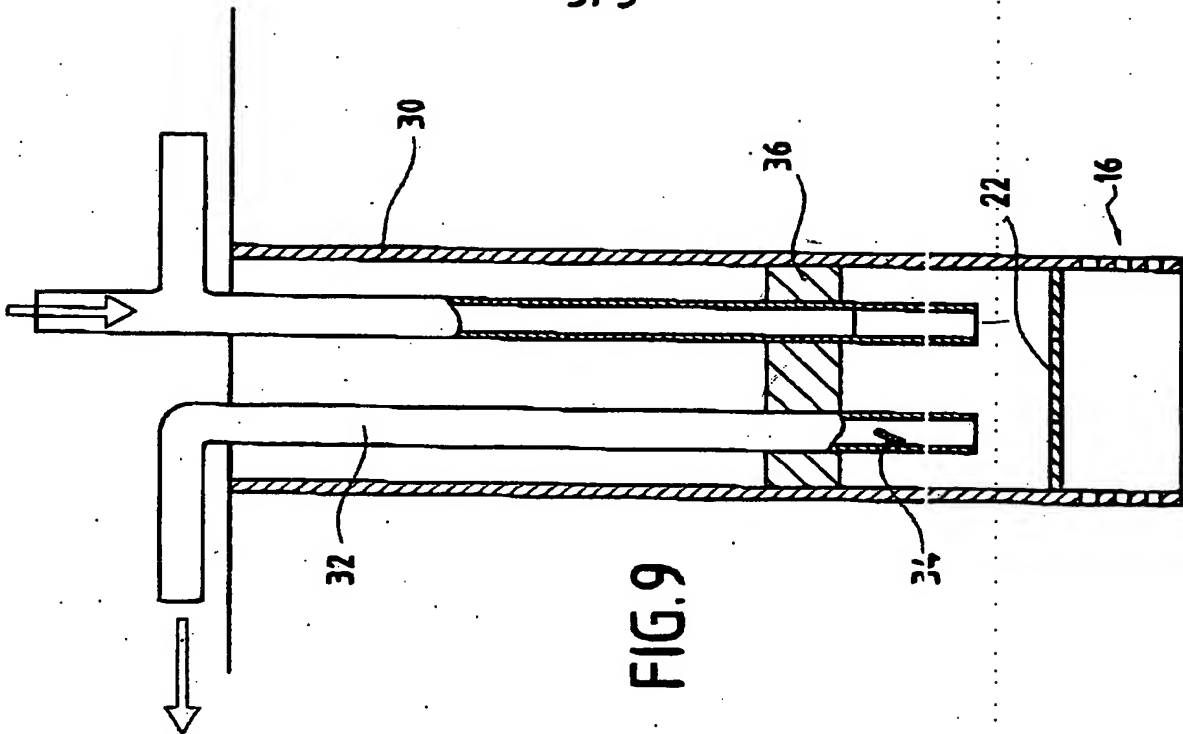


FIG. 9

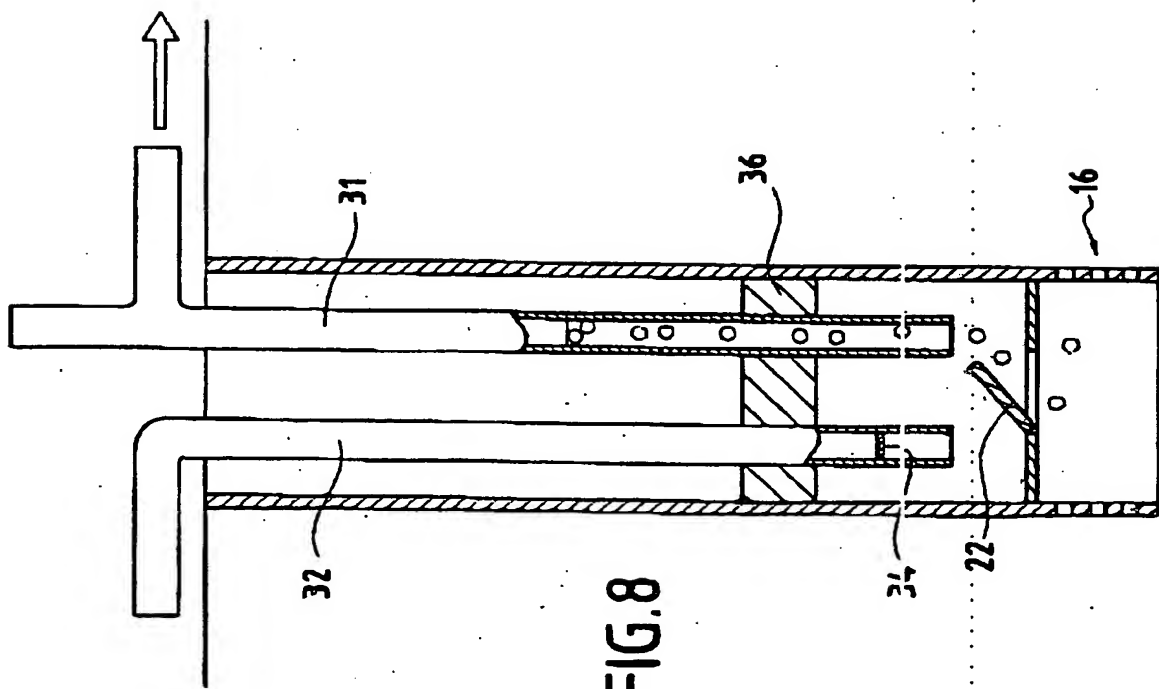


FIG. 8

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